

WHAT IS CLAIMED IS:

1 1. A method for providing redundancy to multi-channel data
2 transmission comprising:
3 selecting a portion of original data from each of a plurality of original
4 channels adapted to transmission through a communication medium;
5 performing at least one encoding operation using said portions of
6 original data to produce at least one portion of redundancy data;
7 including said portion of redundancy data in at least one redundancy
8 channel; and
9 transmitting said redundancy channel along with said original channels
10 through said communication medium.

1 2. The method of claim 1 wherein said selecting, performing, and
2 including steps are repeated before said transmitting step.

1 3. The method of claim 1 further comprising the step of:
2 while performing said transmitting step, repeating said selecting,
3 performing, and including steps.

1 4. The method of claim 1 wherein said encoding operation
2 corresponds to a parity bit calculation.

1 5. The method of claim 1 wherein said encoding operation
2 corresponds to a block code.

1 6. The method of claim 5 wherein said block code is a Reed-
2 Solomon code.

1 7. The method of claim 1 wherein an adaptively controlled level of
2 redundancy is used to perform said encoding operation, said level of redundancy being
3 adaptively controlled according to at least one measure of error-proneness associated
4 with said original channels.

1 8. The method of claim 7 wherein said measure of error-proneness
2 is a signal-to-noise ratio (SNR), signal-to-interference ratio (SIR), or bit error rate
3 (BER).

1 9. A method for correcting error in multi-channel data transmission
 2 having redundancy, the method comprising:
 3 receiving at least one redundancy channel and a number of original
 4 channels belonging to a plurality of original channels, said at least one redundancy
 5 channel and said plurality of original channels being transmitted over a communication
 6 medium;
 7 selecting a portion of redundancy data from said redundancy channel;
 8 selecting a portion of original data from each of said number of original
 9 channels; and
 10 performing at least one decoding operation using said portion of
 11 redundancy data and said portions of original data to correct at least one error in said
 12 plurality of original channels.

1 10. The method of claim 9 wherein said step for performing at least
 2 one decoding operation comprises the step of:
 3 detecting the existence of at least one error.

1 11. The method of claim 10 wherein said step for detecting the
 2 existence of at least one error comprises the step of:
 3 monitoring at least one error-indicating condition during said receiving
 4 step.

1 12. The method of claim 11 wherein said error-indicating condition
 2 relates to carrier signal reception.

1 13. The method of claim 11 wherein said error-indicating condition
 2 relates to demodulation.

1 14. The method of claim 11 wherein said error-indicating condition
 2 relates to in-channel error correction decoding.

1 15. The method of claim 9 wherein said step for performing at least
 2 one decoding operation comprises the step of:
 3 detecting the location of at least one error.

1 16. The method of claim 15 wherein said step for detecting the
2 location of at least one error comprises the step of:
3 monitoring at least one error-indicating condition during said receiving
4 step.

1 17. The method of claim 16 wherein said error-indicating condition
2 relates to carrier signal reception.

1 18. The method of claim 16 wherein said error-indicating condition
2 relates to demodulation.

1 19. The method of claim 16 wherein said error-indicating condition
2 relates to in-channel error correction decoding.

1 20. The method of claim 9 wherein said step for performing at least
2 one decoding operation further comprises the step of:
3 correcting at least one error.

1 21. The method of claim 9 wherein said steps for selecting a portion
2 of redundancy data, selecting a portion of original data, and performing at least one
3 decoding operation are repeated after said receiving step.

1 22. The method of claim 9 wherein said steps for selecting a portion
2 of redundancy data, selecting a portion of original data, and performing at least one
3 decoding operation are repeated while performing said receiving step.

1 23. The method of claim 9 wherein said decoding operation
2 corresponds to a parity bit calculation.

1 24. The method of claim 9 wherein said decoding operation
2 corresponds to a block code.

1 25. The method of claim 24 wherein said block code is a Reed-
2 Solomon code.

1 26. The method of claim 1 or 9 wherein said portions of original data
2 are selected from a common position within their respective original channels.

1 27. The method of claim 1 or 9 wherein each said portion of original
2 data consists of a bit.

1 28. The method of claim 1 or 9 wherein each said portion of original
2 data consists of a non-binary symbol.

1 29. The method of claim 1 or 9 wherein said communication
2 medium is cable-based.

1 30. The method of claim 1 or 9 wherein said communication
2 medium is satellite-based.

1 31. The method of claim 1 or 9 wherein said communication
2 medium is terrestrial.

1 32. The method of claim 1 or 9 wherein said original channels
2 contain audio, video, and/or data signals.

1 33. A system for providing redundancy to multi-channel data
2 transmission comprising:
3 means for selecting a portion of original data from each of a plurality of
4 original channels adapted to transmission over a communication medium;
5 means for performing at least one encoding operation using said portions
6 of original data to produce at least one portion of redundancy data;
7 means for including said portion of redundancy data in at least one
8 redundancy channel; and
9 means for transmitting said redundancy channel along with said original
10 channels in said communication medium.

1 34. A system for correcting error in multi-channel data transmission
2 having redundancy, the system comprising:
3 means for receiving at least one redundancy channel and a plurality of
4 original channels transmitted over a communication medium;
5 means for selecting a portion of redundancy data from said redundancy
6 channel;

7 means for selecting a portion of original data from each of said original
8 channels; and
9 means for performing at least one decoding operation using said portion
10 of redundancy data and said portions of original data to correct at least one error in said
11 portions of original data.

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